

Alexander Meylikhov

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EDUCATION

Harvard University

M.E. in Computational Science & Engineering

Coursework: Stochastic Methods (AM 207), Advanced Numerical Methods (AM 205), Mathematical Modeling (AM 215)

Cambridge, MA

2026 – 2028

Case Western Reserve University (CWRU)

B.S.E. in Mechanical Engineering, Minor in Mathematics

GPA: 3.98/4.00 | Summa Cum Laude | Dean's List (every semester) | Tau Beta Pi

Coursework: Statistics, Linear Algebra, Discrete Math, Machine Learning, Numerical Methods, Game Theory

Awards: Fred Hale Vose Prize; Outstanding Sophomore Award, Case School of Engineering

Cleveland, OH

2022 – 2026

Olympiad: Bronze Medal (top 0.5%), Phystech International Physics Olympiad, MIPT (2021)

QUANTITATIVE RESEARCH PROJECTS

Cross-Venue Price-Gap Dynamics: Kalshi vs. Polymarket

Harvard AM 215, team of 3

Fall 2026

- Built a Kalshi/Polymarket API pipeline: 1-min quote midpoints for 9 matched events (~200K obs.), MAD outlier flags, and ± 30 s nearest-quote alignment (no forward-fill) to avoid spurious lead-lag
- Modeled the gap as a **threshold AR(1)** process with a no-arbitrage band c and reversion rate κ ; fit by grid search + least squares with 1-hour block-bootstrap CIs. Excess-gap half-lives range from **3.6 min** to **2.9 h**; fitted c tracks the bid-ask spread (Spearman $\rho = 0.77$), supporting a transaction-cost interpretation
- Validated with simulation recovery, the closed-form AR(1) limit ($c = 0$), time-step consistency and a 70/30 out-of-sample test: beats a random walk in **7 of 9** markets (1–13% lower error); diagnosed two-speed decay and offset drift

Stochastic Simulation & MCMC

Harvard AM 207

Fall 2026

- Implemented Gillespie's SSA for stochastic predator-prey dynamics and a Metropolis-Hastings sampler (2D Gaussian)

RESEARCH EXPERIENCE

Department of Mathematics and Statistics, CWRU

Undergraduate Researcher, Sequential Decision-Making

Cleveland, OH

Jan 2026 – May 2026

- Developed a time-aware contextual bandit (Action-Centered Thompson Sampling) optimizing intervention timing under a messaging penalty; benchmarked against baseline policies via off-policy evaluation on real data from 40 patients

Two-Phase Flow and Thermal Management Lab, CWRU

Research Assistant, NASA-Sponsored

Cleveland, OH

Jan 2024 – May 2026

- Built a physics-assisted **XGBoost** model on 6,500 measurements from 40 experiments, cutting pressure-drop prediction error from **15% to 7%**; published in *Int. J. Heat and Mass Transfer*
- Built a time-dependent numerical model of two-phase flow for in-space propellant refueling and computer-vision pipelines analyzing 1,000+ images per experiment to validate it

PROFESSIONAL EXPERIENCE

NEURA

Co-Founder & Technical Lead

Cleveland, OH

Feb 2025 – May 2026

- Built a biosensor sleep mask from scratch: real-time 5-channel signal processing, custom CNN for sleep-stage classification (~80% validation accuracy), 6-layer HDI PCB; showcased at CES, raised \$8K

NEERA

Prototyping Engineer

Remote (Portugal)

Jan 2026 – May 2026

- Prototyped custom electronics and sound systems on Raspberry Pi for actuator-integrated sleep mattresses

iTrex Language Services

Software Engineering Intern

Tel Aviv, Israel

Jun 2023 – Jul 2023

- Built automation tools for dynamic task allocation across 30+ employees, reducing latency and improving reliability

PUBLICATIONS, SKILLS & LEADERSHIP

Publications: *Int. J. Heat and Mass Transfer* 255 (2026), physics-assisted ML; *AIAA SciTech* (2026), flow-boiling visualization

Programming: Python (NumPy, Pandas, scikit-learn, XGBoost, PyTorch, Matplotlib), R, MATLAB, Git/GitHub, LaTeX

Quantitative Methods: time-series & mean-reversion models, Monte Carlo & MCMC, bootstrap inference, Bayesian bandits

Leadership: TA (Calc II, Statics); Scuba Club President | **Languages:** Russian (native), English (fluent) | **Interests:** jazz sax